

Dental Hygiene and Children

An Honors Thesis (HONORS 499)

by

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Table of Contents:

Abstract.....	3
Acknowledgements.....	5
Introduction.....	6
Healthy People Goals and Objectives.....	6
Anatomy and Physiology of the Tooth and Gums.....	8
Risk Factors.....	9
Nutrition and Disease Processes.....	9
Age.....	12
Socioeconomic Status and Cognitive Ability.....	12
Ethnicity and Race.....	14
Complications.....	14
Dental Caries.....	15
Periodontal Disease.....	16
Interventions.....	18
Water Fluoridation.....	18
Sealants.....	20
Role of Nurse.....	21
Conclusion.....	22
References.....	24

Abstract

According to the Center for Disease Control in 2010, Americans make roughly 500 million visits to the dentist each year. It is estimated that \$102 billion was spent on dental services in the United States for the year 2009 (National Center for Chronic Disease Prevention and Health Promotion, 2010). Many of these visits can be prevented with good dental hygiene. However, many barriers to the prevention of dental problems exist that eventually add to the cost of dental care. The purposes of this project were to determine the effects of poor dental hygiene on children by 1) researching information about steps taken to prevent or reduce poor dental hygiene; 2) identifying risk factors that contribute to poor dental hygiene, 3) identifying complications related to poor dental hygiene; 4) identifying the role of the nurse in promoting good dental hygiene; and 5) creating a pamphlet for students and their parents at Head Start in Muncie, Indiana that explains the importance of good dental hygiene.

Data indicated that many dental health problems can be prevented (NCCDPHP, 2010). Poor dental hygiene is associated with socioeconomic status, access to healthcare, age, cognitive ability, and nutrition. Research shows that children who have lower socioeconomic status are at higher risk of having poor dental hygiene (Parthasarathy & John, 2008). Lack of access to healthcare is indicative of poor dental hygiene because children are not receiving the necessary measures to help prevent dental caries (Szilagyi, 2009). Dental caries are the most common pediatric disease, increasing health risks for children with poor dental hygiene already (Szilagyi, 2009). Nutrition is a key factor in dental hygiene (ADA, 2007). Malnutrition and poor food preferences including acidic beverages increase the risk of poor dental hygiene (ADA, 2007).

Teaching children at a young age good dental hygiene habits can benefit them in the future. Nurses are prime leaders in promoting good dental hygiene. Nurses advocate for clients

who lack crucial access to health care and are active in raising awareness about good dental hygiene and its effects on health. Overall, good dental hygiene is not considered an important problem in health, but through education and intervention by the nurse, dental hygiene can be given the attention that it needs.

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Introduction

Research has shown the detrimental effects of poor dental hygiene in children (NCCDPHP, 2010). Dental hygiene is learned as a child and helping children form good habits can result in healthy teeth for a lifetime. Dental hygiene has not been considered an important issue in terms of overall health until recently (ADA, 2007). However, we know good dental hygiene enriches our sense of smell and taste; helps us speak, smile, chew, and swallow; and helps form facial expressions. Poor dental hygiene can lead to caries or oral cancer and ultimately diminish quality of life. One-fourth of the United States population, consisting of adults ages 65 years and older, have lost all their teeth, often as a result of lifelong poor dental hygiene (National Center for Chronic Disease Prevention and Health Promotion, 2010).

Healthy People Goals and Objectives

Overarching goals of Healthy People 2010 are to decrease health disparities and specific objectives from Healthy People 2010 address the issue of poor dental hygiene (United States Department of Health and Human Services, 2009). Objective 21-9 calls for an increase in “the proportion of the United States population served by community water systems with optimally fluoridated water” (USDHHS, 2009, pg. 1). The target for this objective was to have 75% of all citizens in each state have fluoride in public water systems. However, only 27 states have met this goal (NCCDPHP, 2010). As shown in Developing Healthy People 2020, this objective (OH HP2020-2) has been retained (USDHHS, 2009), making the process of water fluoridation in public water systems an important factor in preventing dental caries.

Healthy People 2010 objective 21-10 aims at increasing the percentage of “children and adults who use the oral health care system each year” (USDHHS, 2009). This objective also has been retained for use in the Developing Healthy People 2020 (USDHHS, 2009). The objective

addresses access to healthcare that increases risk for poor dental hygiene. A second objective, 21-12, from Healthy People 2010 also relates to access to healthcare targeting an “increase the proportion of low-income children and adolescents who received any preventive dental service during the past year” (USDHHS, 2009, pg.1). Socioeconomic status as mentioned in this objective has a direct effect on and can increase risk for poor dental hygiene in children. This objective is being retained and incorporated for Healthy People 2020 (USDHHS, 2009).

Some objectives are retained, however modified, in Healthy People 2020 (USDHHS, 2009). The Healthy People 2010 objective 21-8 had the original target of 50% of all children aged 8 having dental sealants (NCCDPHP, 2010). However, the National Center for Chronic Disease Prevention and Health Promotion (2010) reveals that only eight states met the target. A modified objective states the target is to increase the percentage of children who receive dental sealants on their molar teeth (USDHHS, 2009). This objective is directed at children aged 3-9 and adolescents aged 13-15 (USDHHS, 2009).

As noted in the previous discussion, Healthy People 2010 and Developing Healthy People 2020 objectives are intended to promote better dental hygiene in the United States and primarily among children and adolescents. By teaching children at an early age the proper way to maintain good dental hygiene, the health care professional can positively affect dental hygiene across the lifespan. Risk factors should be identified early to prevent complications of poor dental hygiene. Understanding the anatomy and physiology of teeth and gums facilitates identifying risk factors and interventions to maintain good dental hygiene.

Anatomy and Physiology of the Tooth and Gums

Primary teeth, 20, erupt between the ages of 6 to 33 months (Children and Youth Health, 2009). The first primary teeth to emerge are usually the lower two front teeth (CYH, 2009). By the age of 3, all 20 primary teeth should have come through. Permanent teeth, 32, include 4 wisdom teeth; although not all persons have wisdom teeth. The first permanent tooth erupts around the age of 6. Usually by the age 13, most children have all 28 permanent teeth (CYH, 2009). Around the ages of 17-21, wisdom teeth emerge (CYH, 2009).

As explained by Simplyteeth Limited (2004), the anatomy of the tooth can be split into two parts: the crown and the root. The crown is the part of the tooth that is visible in the mouth and is made up of enamel, dentine, and pulp. Enamel is the hard, white covering over the crown. It does not have a nerve supply or a blood supply and is the hardest material in the body. Dentine, a hard cream colored material, is covered by enamel and by cementum on the roots; and makes up the bulk of the tooth. Dentine protects the pulp in the crown and roots. The pulp is located in the root canals and the pulp chamber in the crown and contains blood vessels and nerves for the tooth. If injured or exposed to decay, the pulp will become infected and die. This causes severe pain and root canal treatment is conducted.

The roots of teeth are implanted in the tooth socket in the jaw bone. Each root has its own canal through which nerves and blood vessels pass. Roots are held in place by the periodontal ligament and covered by cementum. The purpose of the periodontal ligament is to attach the roots to the alveolar bone of the jaw and to act as an elastic cushion between the tooth and bone. Cementum has no nerve supply and is a calcified, thin covering of the roots (Simplyteeth Limited, 2004). The gum line is defined as the place where teeth and gums meet (Seagull, 2003).

The gums support the structure of teeth; if plaque and tartar build-up is substantial, this can lead to periodontal disease or gingivitis (Seagull, 2003).

The tooth functions as a mechanism to masticate foods. Function of the tooth is based on the shape of the crown; molar teeth have flat surfaces used for grinding food while front teeth are chisel-shaped and sharp for cutting (Seagull, 2003). The salivary glands in the mouth produce saliva that contains digestive enzymes that break down carbohydrates into simple sugars. This provides the rationale for brushing teeth after eating. The longer the sugar remains in the mouth, the more damaging the effects. Bacteria grow in the presence of sugar. An increase in sugar consumption results in an increase of bacteria and acid multiplying in the mouth (Seagull, 2003) which can lead to dental caries.

Risk Factors

Nutrition and Disease Processes

Nutrition is a primary risk factor for poor dental hygiene. The American Dietetic Association discussed the importance of nutrition in relation to dental hygiene in its journal in 2007;

“It is the position of the American Dietetic Association that nutrition is an integral component of oral health. The American Dietetic Association supports the integration of oral health with nutrition services, education, and research. Collaboration between dietetics and dental professionals is recommended for oral health promotion and disease prevention and intervention.” (ADA, 2007, pg. 1)

Poor diet is associated with higher numbers of dental caries as well as periodontal disease (ADA, 2007). Although primarily caused by bacteria, periodontal disease has systemic influences such as diabetes, cardiovascular disease, stress, decreased immune status, and

osteoporosis (ADA, 2007). Certain nutrient deficiencies such as magnesium, vitamin C, and protein can affect the systemic response to infection and inflammation (ADA, 2007). Delayed wound healing and decreased immune response is associated with malnutrition. The body requires protein in order to have timely wound healing and for the body to be able to respond to any infection. This makes it very important to consider diet as one of the solutions to poor dental hygiene as well as maintaining general overall health (ADA, 2007).

Various health-related problems have a direct correlation with dental hygiene (ADA, 2007). With many systemic and chronic diseases, the risks for poor dental hygiene increase because the oral cavity serves as the entry portal to the gastrointestinal tract. In relation to diabetes mellitus, individuals with this chronic disease have an increased risk of having and severity of dental complications including gingivitis, caries, oral mucosal disease, and periodontal disease as well as fungal infections like oral candidiasis (ADA, 2007). The complications occur because diabetes leads to altered permeability in the vascular system and increased levels of sugar resulting in hyperglycemic saliva that erodes tooth enamel and creates opportunities for bacteria growth in the mouth (ADA, 2007).

Among ten of the most common cancers in the United States is oropharyngeal cancer. The survival rate is 50% in the United States (ADA, 2007). There is a high risk of additional primary tumors in the oral cavity with this type of cancer. In one meta-analysis study (2005), there was a reduced risk of oropharyngeal cancer with the consumption of citrus fruit and vegetables (ADA, 2007). The chemopreventive effects from green tea polyphenols is linked to preventing oral leukoplakia, and cancer in the mouth and gastrointestinal tracts (ADA, 2007). Therapy for oropharyngeal cancers can cause complications that may affect the individual's appetite and ability to eat. Radiation and chemotherapy have negative side effects that include

but are not limited to tooth loss, alterations in chewing and swallowing function, loss of sense of taste, painful stomatitis, and xerostomia. Poor nutrition leads to dental complications that in turn affect nutritional status. (ADA, 2007).

Acidic drinks such as sports drinks can lead to the erosion of teeth and should be addressed. If the pH of mouth tissues and plaque is between 5.5 and 6.0, the acid can destroy the roots under the gum line (Seagull, 2003). A pH below 5.5 demineralizes the enamel that covers the crown resulting in tooth decay (Seagull, 2003). In an article published by *Obesity, Fitness & Wellness Week* (2008), a report states that the pH of beverages is not the only factor that can lead to tooth erosion. The beverage's ability to neutralize acid is also an important factor. Since energy drinks are becoming popular among adolescents, the acid found in these carbonated beverages result in susceptible permanent teeth and an increase in dental caries in this age demographic (Obesity, Fitness & Wellness Week, 2008). A study performed by Sohn, Burt, and Sowers analyzed the fluid consumption patterns of children aged 2-10 years. The high consumption of carbonated soft drinks was found to be a risk indicator for dental caries in primary teeth as compared to fluid consumption of milk, water, or juice (Sohn, Burt, & Sowers, 2006).

Infants and children are at a higher risk of poor dental hygiene due to poor nutrition. Increased incidence of caries, salivary gland atrophy, and a reduction of saliva production is associated with an episode of mild to moderate malnutrition in the first year of life (ADA, 2007). Poor feeding practices such repeated consumption of sugary and highly processed starch foods increases the risk for caries significantly (ADA, 2007).

One specific factor that involves adolescents, especially females, is eating disorders. It is the third most common chronic illness for adolescent females (ADA, 2007). Acidic contents

from the gastrointestinal tract that comes in contact with teeth during purging can cause tooth erosion. Inadequate nutritional intake from anorexia nervosa affects oral health because the individual is not consuming enough nutrients to maintain healthy gums and teeth (ADA, 2007).

Age

The American Dietetic Association reports an association of age with increased risk of having dental caries. Dental caries affect 35% of children at the age of 3, 50% of children from the ages of 5 to 9 years old, and 85% of adults 18 years of age and older (ADA, 2005). Of the 4 million children born each year, over 2 million children will have dental caries by the second grade (American Academy of Pediatric Dentistry, 2010). Almost half of all the children in the United States under the age of 5 will have tooth decay (American Academy of Pediatric Dentistry, 2010).

Older persons are at an increased risk of poor dental hygiene. Older persons have common dental conditions such as xerostomia and oral candidiasis (Gonsalves et al., 2008). Xerostomia affects 29-75% of the older population (Gonsalves et al., 2008). Saliva lubricates the mouth, promotes remineralization of teeth to prevent decay, and protects against bacterial and fungal infections (Gonsalves et al., 2008). With the decrease in saliva, this directly affects dental hygiene and raises the risk for older persons.

Socioeconomic Status and Cognitive Ability

Socioeconomic status directly affects dental hygiene with low-income families having an increased risk for poor dental hygiene. Half of children ages 6 to 10 from low-income families have untreated dental caries (Parthasarathy & John, 2008) and two-thirds of children aged 12-19 have had dental caries (National Center for Chronic Disease Prevention and Health Promotion, 2010). Though 9 million children in the United States do not have medical insurance, 23 million

children do not have dental insurance (American Academy of Pediatric Dentistry). Inadequate dental care for children presents a challenge in promoting good dental hygiene at a young age.

In a recent study, researchers examined the relationship between socioeconomic inequalities and cognitive abilities with dental hygiene (Sabbah et al., 2009). Sabbah et al (2009) examined cognitive ability as related to oral health (measured by gingival bleeding, tooth loss, and loss of periodontal attachment) and “changes in socioeconomic inequalities in oral health after adjustment for indicators of cognitive ability” (Sabbah et al., 2009, pg. 1). Three outcomes were used to measure oral health: the extent of gingival bleeding, the extent of periodontal attachment loss of 3mm or more, and the number of missing tooth surfaces due to disease. The researchers used level of education and poverty-income ratio to determine socioeconomic status. Poverty-income ratio is described as the ratio between poverty threshold and family income. There were three education groups: fewer than 12 years, 12 years, and more than 12 years.

Participants of the study completed cognitive tests from the Neurobehavioral Evaluation System (Sabbah et al., 2009). Three tests were used in this study to determine cognitive ability: simple reaction time, symbol digit substitution, and serial digit learning tests. Four thousand four hundred and sixty-five participants, 20 to 59 years old, completed the cognitive tests and had a dental examination. Results of this study indicated that individuals with poorer cognitive ability had overall poorer oral health; participants that had poorer cognitive ability as indicated by the three tests had higher numbers of missing tooth surfaces. When compared to poverty-income ratios and education level, the lower the education level and the poverty-income ratio, the higher the number of oral health indicators for poor dental hygiene (Sabbah et al., 2009).

Data from the National Institute of Dental and Craniofacial Research also found a correlation between the level of education and prevalence of periodontal disease. The prevalence

of periodontal disease was 17.33% in individuals with less than a high school education, 9.34% in individuals with a high school education, and 5.78% in individuals with more than a high school education (NIDCR, 2010).

Ethnicity and Race

Despite the Healthy People 2010 goal to eliminate health disparities (United States Department of Health and Human Services), it is clear that health disparities still exist in dental hygiene, especially racial disparities. Non-Hispanic Black and Mexican American children are more likely to have dental caries than non-Hispanic White children (Tomar & Reeves, 2009). Forty percent of Mexican American children aged 6-8 compared to 25% of non-Hispanic whites have untreated dental caries (National Center for Chronic Disease Prevention and Health Promotion, 2010). The use of dental sealants among 14 year old White children is almost 4 times that among African American children (Allukian, 2008). Among Alaska Native children and American Indian children aged 2 to 4 year, the rate of untreated dental disease is 6 times among White children (Allukian, 2008). Prevalence of oral cancer mortality is twice high for African American males as compared to Caucasian males (Allukian, 2008). Racial disparities remain a risk factor in dental hygiene.

Complications

Poor dental hygiene can result in numerous complications. Many of these complications can be prevented (NCCDPHP, 2010). Most research has focused on dental caries and periodontal disease which encompasses gingivitis and periodontitis. Each of these complications have specific risk factors.

Dental Caries

Dental caries are common for people of all ages, however especially in children. Dental caries are the most common childhood chronic disease (National Center for Chronic Disease Prevention and Health Promotion, 2010) According to the National Center for Chronic Disease Prevention and Health Promotion, more than one-fourth of children aged 2-5 years old and one-half of children ages 12-15 years old in the United States are affected by tooth decay. Dental caries impact 40% of all children aged 2 to 11 in the United States (Edelstein, 2009). The incidence of primary dental caries in children aged 2 to 4 increased from 18% in 1988-1994 to 24% in 1999-2004 (Tomar and Reeves, 2009). Dental caries are five times more common than asthma and seven times more common than hay fever (Benjamin, 2010). Children with untreated caries experience school absences, concentration problems, acute pain, poor nutrition, and altered appearance that affect a child's self-esteem and way of life.

Early childhood caries (ECC) is a term used to describe the dental caries epidemic in infants and children. ECC is defined as "the presence of one or more decayed, missing or filled tooth surfaces in any primary tooth in a child 71 months of age or younger" (Ezer, 2010, abstract). ECC affects the quality of life and health of children and places a financial burden on the family. Direct consequences of ECC include pain and infection. These consequences alter the child's nutritional status through decreased ability to eat and the child is at risk for weighing less than 80% of ideal weight (Ezer, 2010). Children affected by ECC are at risk for impaired physical growth and developmental delay (Ezer, 2010). Treatment for ECC costs around \$1,000 per child per year (Ezer, 2010).

Dental caries are preventable (NCCDPHP, 2010) and steps should be taken to decrease the incidence of dental caries. One research study shows that if good oral hygiene habits are

established at an early age, it provides a foundation for better dental hygiene. This was measured by reduced incidence of caries as adolescents (Alm et al., 2008). Data regarding dental caries in children is staggering and the expense of dental caries can be overwhelming.

Periodontal Disease

Periodontal disease is another complication of poor dental hygiene. Periodontal disease results from bacterial infection that affects gum tissue with subsequent destruction of gums and bone. Around 60% to 65% of the United States population has periodontal disease (Dunning, 2009). Severe periodontal disease affects 4-12% of adults (NCCDPHP, 2010). Research has linked oral infections to premature low-weight births, heart disease, sepsis, and diabetes (National Center for Chronic Disease Prevention and Health Promotion, 2010).

Half of cases involving advanced periodontal disease are associated with cigarette smoking (NCCDPHP, 2010). Smoking contributes to half the risk of periodontitis in the United States (Pihlstrom et al., 2005). Smokers are three times more likely to have periodontal disease than people who have never smoked (NCCDPHP, 2010). In long-term smokers, the risk of periodontal disease is equal to the risk of lung cancer (Pihlstrom et al., 2005). Also, smoking creates a negative and altered response to periodontal treatment and other oral interventions (Pihlstrom et al., 2005).

Studies indicate that periodontal disease is a risk factor for preterm low birth weight children. Lopez, Smith, and Gutierrez (2002) investigated if maintenance of periodontal health during pregnancy would reduce the risk of preterm low birth weight. Results of the study show that periodontal disease is a risk factor for preterm low birth weight and increases the risk for preterm birth (Lopez et al., 2002).

Periodontal disease serves as a risk factor for acute myocardial infarction (Kaisare et al., 2007). Atherosclerosis involves inflammation and is linked with periodontal inflammation, both associated with progression of coronary artery disease and stroke (Pihlstrom et al., 2005). Periodontitis and atherosclerotic disease are linked to increased levels of C-reactive protein, cytokines, and fibrinogen (Pihlstrom et al., 2005). Radiographic evidence illustrates that severe periodontal bone loss is associated with plaque build-up in the carotid artery that can lead to a stroke (Pihlstrom et al., 2005). Risk is almost four times greater for carotid artery plaque development than for those who have no periodontal disease (Pihlstrom et al., 2005). Another study suggests that periodontal disease and fewer teeth are associated with ischemic stroke with a 1.6 times higher risk (Pihlstrom et al., 2005).

The occurrence of periodontal disease in individuals with diabetes is 85% to 90%, compared to the 60% to 65% of the overall United States population with periodontal disease (Dunning, 2009). Considered the sixth diabetes complication, periodontal disease contributes to the progression of altered glucose tolerance in diabetes (Dunning, 2009). Demmer et al. (2008) reported periodontal disease to be “an independent predictor of incident diabetes in the nationally representative sample of NHANES I” (Demmer et al., 2008, Abstract). Periodontal disease and diabetes have a relationship that resembles a cycle. Diabetics are at higher risk of having periodontal disease and individuals with periodontal disease tend to have hyperglycemia; other organs and tissues also are affected (Dunning, 2009).

Prevention of periodontal disease results from better dental hygiene, decreasing risk and/or severity of associated diseases such as heart disease and diabetes (NCCDPHP, 2010). Research shows that periodontal treatment improves glycemic control in type 2 diabetes patients (Teeuw et al., 2010).

Interventions

With the present state of the economy and healthcare reform, measures are being taken to help reduce healthcare costs. Americans make roughly 500 million visits to dentist offices each year and it is estimated that in 2009, the cost of dental services in the United States was \$102 billion (National Center for Chronic Disease Prevention and Health Promotion, 2010). Oral health problems are very costly and steps should be taken to reduce cost as well as prevent complications.

Water Fluoridation

The American Dietetic Association published a position statement on the health impact of fluoride in 2005;

“The American Dietetic Association reaffirms that fluoride is an important element for all mineralized tissues in the body. Appropriate fluoride exposure and usage is beneficial to bone and tooth integrity and, as such, has an important, positive impact on health throughout life.” (American Dietetic Association, 2005, pg. 1)

Fluoride use is recognized as “the most effective dental public health measure in existence” in preventing dental caries (American Dietetic Association, 2005, pg. 1). Fluoride reduces demineralization of dental enamel while promoting remineralization of enamel. A 10-year, 1944-1954, study in Grand Rapids and Muskegon demonstrated effectiveness of fluoridated water, at an optimal level of 1 p. p. m., in reducing the number of dental caries in both primary and permanent teeth (Arnold Jr. et al, 2006). In a study examining the prevalence of dental caries in fluoridated water in South Australian children, the group with no exposure to fluoridated water had a significantly higher incidence of caries than groups that were exposed to

fluoridated water (Do & Spencer, 2007). The same groups that were exposed to fluoridated water during birth to the age of three had a lower risk of having dental caries at the age of 6 than the group with no exposure (Do & Spencer, 2007).

The World Health Organization (WHO) reports that a concentration of fluoridated drinking-water of around 1 mg l^{-1} is linked to a lower prevalence of dental caries, especially in children (Fawell et al, 2006). However, excess intake of fluoride can be detrimental and result in dental fluorosis (Fawell et al, 2006). WHO explains that the level of dental caries at a fluoride concentration of 0.1 mg l^{-1} is a seven, but when the fluoride concentration is increased to 1.0 mg l^{-1} , the level of dental caries falls to 3.5 (Fawell et al, 2006).

The American Dietetic Association reports that according to 2002 data from the Centers for Disease Control and Prevention (CDC), 67% percent of the U. S. population (over 170 million people) drank water supplemented with fluoride levels that are optimal for preventing cavities. The percentage of the United States population served by fluoridated public water systems increased from 62.1% in 1992 to 65% in 2000, and to 69.2% in 2006 (Bailey et al, 2008). The percentage of fluoridated community water systems during 1992-2006 increased in 39 states (Bailey et al, 2008).

The CDC is pushing states to establish community water fluoridation because it is not only cost-effective, but fluoride has been proven to reduce dental caries (ADA, 2005). A study by the CDC discovered that communities with over 20,000 residents, that invested \$1 per person in water fluoridation saved about \$38 each year from fewer caries treated (NCCDPHP, 2010).

Fluoride treatment continues to be an effective means of preventing dental caries. Safe levels of fluoride in drinking water remain cost-effective and benefit everyone, especially

children. Steps should be taken to promote optimal fluoride levels in community water systems. The benefits are too numerous to ignore (Fawell, 2006).

Dental Sealants

Another method to prevent caries that is safe and effective is the use of dental sealants. Dental sealants are plastic coatings that are placed on the back molar teeth where most decay occurs because majority of the chewing occurs there (Lesser, 2001). The CDC supports dental sealant use to prevent dental caries and thus reduce the number of dentist visits and associated costs (NCCDPHP, 2010). Sealants last 5 to 10 years (CDC, 2009). It is more beneficial to apply a sealant to permanent teeth instead of waiting for decay to occur and then filling caries. Dental caries damage teeth permanently whereas sealants protect teeth (CDC, 2009). Dental sealants have benefits that include saving money, time, and discomfort from procedures to fill caries (CDC, 2009). Dental fillings are not permanent and with each filling, the tooth becomes less sturdy (CDC, 2009).

Dental sealants are not always cost effective, but when used in populations with high risk for caries, dental sealants are highly cost effective (Ouyang, 2009). Children who come from lower-income families are twice as likely to have tooth decay as compared to children from higher-income families; they are only half as likely to have dental sealants due to lack of dental insurance and resources (NCCDPHP, 2010). One *Healthy People 2010* objective was to have 50% of all children at the age of 8 to have dental sealants. The National Center for Chronic Disease Prevention and Health Promotion website reveals that only eight states had 50% or more of children aged 8 years of age had dental sealants (NCCDPHP, 2010).

The use of dental sealants is underutilized (Lesser, 2001). This becomes a public health issue since dental sealants have been shown to be effective in decreasing the prevalence of dental

caries. Results from a 15-year study by Simonsen indicate that “74% of permanent first molars that received sealants remained caries free” (Lesser, 2001, pg.3). More education and public awareness about the beneficial effects of dental sealants should be established in communities.

Water fluoridation and dental sealants are interventions that can reduce the likelihood of dental caries and be cost effective (NCCDPHP, 2010). Water fluoridation is a simple process that is proven to prevent dental caries (ADA, 2005) and the cost effective results are too great to ignore. The longevity of dental sealants help decrease dental caries in children (CDC, 2009) who are more at risk for developing dental caries (AAPD, 2010).

Role of Nurse

Research provides evidence of the positive correlation between health and dental hygiene (ADA, 2007). Poor dental hygiene affects teeth and gums physically; dental caries and periodontal disease influence a person’s emotional stability and nutritional status. Children and parents should be informed of risks to overall health caused by poor dental hygiene. Nurses are encouraged to care for patients holistically, physically and emotionally. Nurses are valuable advocates in the effort to raise awareness about the importance of dental hygiene.

Health care professionals who provide care for children are more likely than dentists to have the opportunity to start teaching good dental hygiene and prevention of complications (Hallas & Shelley, 2009). This is especially true with infants and children from lower socioeconomic group and minorities who are not likely to visit a dentist until age one year or later (Buerlein, 2010). Dental hygiene interventions become the responsibility of pediatricians and nurses to provide information about dental hygiene. Non-dental health professionals have to assume the task of identifying risk factors for dental caries and other dental health problems.

Early detection of risk factors and intervention can lead to absence of caries and periodontal disease (Hallas & Shelley, 2009).

Nurses should be educated about the importance of good dental hygiene in order to facilitate healthy dental hygiene practices in patients and themselves (Duffin, 2008). Studies show that nurses' neglect of their patient's dental hygiene is correlated to neglect of their own teeth (Duffin, 2008). The fear of going to the dentist may prevent nurses from making dental hygiene a priority in caring for their patients (Duffin, 2008). If nurses make dental hygiene a priority, clients can perceive it as a priority as well (Duffin, 2008).

Children are often seen by nurses more frequently than other health care professionals. This facilitates creating rapport with the client and fosters a trusting relationship (Mouradian et al., 2009). The nurse then can provide teaching regarding the importance of maintaining good dental hygiene to reduce complications throughout life. School nurses, for example, can observe for children at risk for poor dental hygiene and refer them to dental consultants when needed (Buerlein, 2010). School nurses also can advocate for healthy menus in schools, promote good dental hygiene by creating presentations for students, and share information with families on prevention and management of dental caries (Buerlein, 2010).

Conclusion

The May 2000 Surgeon General's report, "Oral Health in America," reported that over 51 million school hours are lost to dental-related conditions each year (American Academy of Pediatric Dentistry, 2010). Good dental hygiene has become more and more important as research reveals the detrimental effects of poor dental hygiene. Healthy Smiles, Healthy Children is a foundation through the American Academy of Pediatric Dentistry (AAPD) that promotes

good dental hygiene in children. AAPD provides grants that help children have access to dental care.

Promoting good dental hygiene in children is most effective, reduces complications of poor dental hygiene and can lead to a caries-free adulthood (Innes & Evans, 2009). Nurses, teachers, and family members play major roles in promoting good dental hygiene in children. Children need to be taught proper dental hygiene beginning with eruption of the first tooth fostering healthy dental habits as they grow towards adulthood (Szilagyi, 2009).

Of course educating children about good dental hygiene will not be effective if access to dental care is not improved. The disparities in dental care among children are growing despite the *Healthy People 2010* goal. One of the overarching goals of Healthy People 2010 is to decrease disparities in areas such as oral health. The Healthy People 2010 and Healthy People 2020 objectives aim to reach this goal have resulted in an increasing number of community water systems with fluoridated water, increasing percentage of children and adults who use dental health care each year, and increasing number of dental sealants in children (HHS, 2009).

Dental care guidelines must be supported by policies, regulation, and interventions to reduce disparities related to socioeconomic status and race. The Healthy People 2010 goal currently is to use the resources available in the community such as fluoridated drinking water and education of children and adults about the benefits of good dental hygiene.

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Explanation of project

This particular project is very special to me because it reflects my passion for children and health. Much of the nursing profession deals with education. I chose to make an educational flyer for the Head Start in Muncie because I believe it is essential to teach children the importance of good dental hygiene at an early age. This will help foster good dental hygiene habits over a lifetime. After researching dental hygiene, I discovered that children are at the biggest risk for dental caries and targeting this age range is a preventative measure to decreasing the prevalence of dental caries. The flyer contains important information for parents about the statistics of dental caries and ways to help promote good dental hygiene in their children. On the back of the flyer, I made a fun page for children. I added coloring pictures and a word search in hopes of getting children excited about proper dental hygiene. I hope that this flyer will help parents and children recognize the importance of dental hygiene and its effects on health.

TIPS on how to improve your child's dental hygiene:

- Avoid foods that are full of sugar in between meals.
- If eating in between meals, brush teeth afterwards.
- Choose non-carbonated drinks like water, milk, or juice over soda drinks.
- Use fluoride toothpaste to help prevent cavities. If your child is between the ages of 18 months and 5 years old, use low-fluoride toothpaste.
- Choose a toothbrush with soft bristles so it does not irritate the gums.
- It is recommended that children should have their first dentist check-up around when the first tooth appears or by the first birthday.
- About once a month, lift your child's top lip and look for early signs of tooth decay.

Out of the 4 million children born each year, more than half of these children will have cavities by the second grade. Help decrease that number and give your child a healthy smile. Visit the American Academy of Pediatric Dentistry website for parents for more information:

<http://www.aapd.org/pediatricinformation/>

Contact a dentist if you have any questions or concerns about your child's dental health.

FACTS ABOUT DENTAL HYGIENE

What is dental hygiene?

Dental hygiene is the practice of keeping the mouth, gums, and teeth healthy and clean in order to prevent disease. This includes regular brushing & flossing and scheduled visits to the dentist.

What are the facts?

According to the National Center for Chronic Disease Prevention and Health Promotion, more than one-fourth of children in the United States aged 2-5 years old have dental cavities.

Why is dental hygiene important?



Dental hygiene enriches our sense of smell and taste; helps us speak, smile, chew, and swallow; and helps form our facial expressions. Poor dental hygiene can lead to cavities or gum disease and lessen the quality of life. Dental hygiene habits are developed as a child, making it important to teach children good dental hygiene habits.

What can I do to help my child?

Ensure that your child is using the correct technique for brushing teeth. Encourage your child to floss daily and to brush for two minutes. The use of fluoridated toothpaste is encouraged for children as it helps prevent cavities; follow the directions on the toothpaste container. Also, schedule a visit to the dentist every six months for your child. Early prevention can help reduce the risk of dental problems.

Who can I contact to schedule an appointment for my child?

- Open Door Dental Clinic: 765-286-7000
- Dr. Jeffrey Rector: 765-286-4017
- Dr. Steven Staton: 765-286-3116
- Dr. Jaime Lemna: 765-288-8812
- Dr. Michael Musal: 765-288-5527
- Dr. Hub Hougland: 765-284-1883

Here are some educational and fun websites that are kid-friendly and will help your child learn more about teeth:

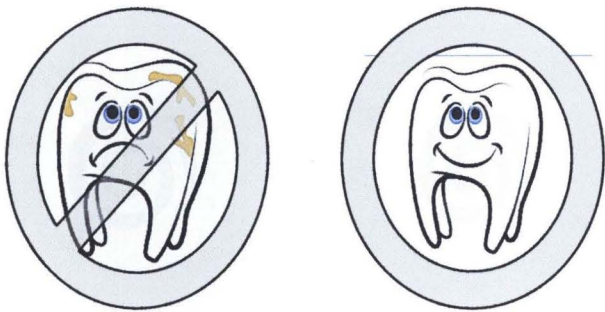
<http://www.healthyteeth.org>
<http://www.adha.org/kidstuff/index.html>



JUST FOR KIDS!

Brushing your teeth is important. It helps keep the bad cavities away!

Say NO to cavities!



Brush your teeth and make them clean!

COLOR THIS PICTURE!



WORD SEARCH:

Y W M P T O J O Q D
 T O O T H P A S T E
 F E E I L P B S I W
 H S U R B H T O O T
 F L U O R I D E S H
 S M U G Q T A R E T
 P D L T I S T A I E
 A J E V M Z Q G R E
 C A L C I U M U A T
 Z R O N M E L S C W

CALCIUM	TOOTHBRUSH
TEETH	CARIES
TOOTHPASTE	SUGAR
FLUORIDE	GUMS

Hey kids!
 Don't forget to brush your
 teeth at least twice a day and
 floss regularly!

Q: Why did the
 tree go to the
 dentist?
 A: To get a root canal!

Q: What time do
 you go to the
 dentist?
 A: Tooth-Hurty!

